Bedside clinical data provide an hourly and accurate biomarker for severe sepsis classification

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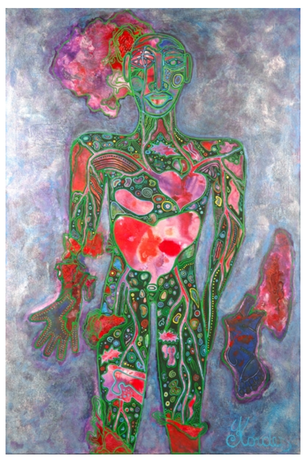
Severe sepsis is common, deadly & costly

Severe sepsis is organ failure and SIRS due to infection [1].



NZ and AUS ICU [2]

11.8% incidence

0.77 per 1000 prevalence

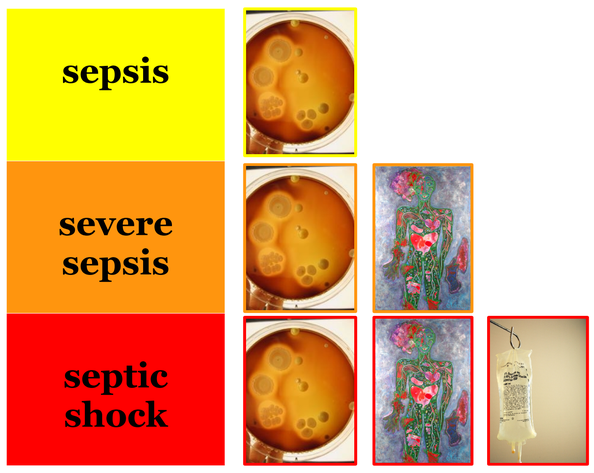
26.5% mortality

6x treatment cost [3]

$16.7B USD total cost [4]

A need for real-time diagnostics

Sepsis severity increases with concurrent



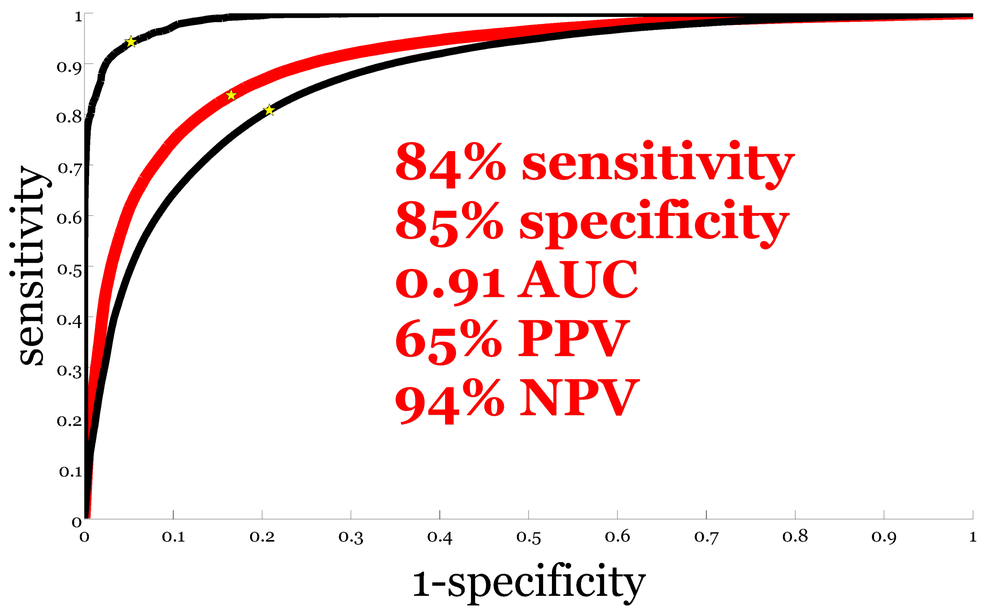
SIRS due to infection,

organ failure,

and clinical intervention [5].

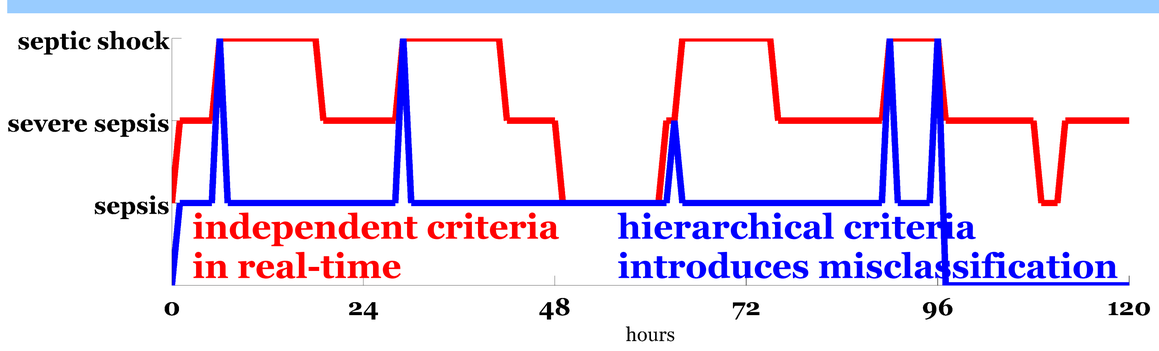
However, hierarchical criteria fails when physiological responses are resolved, yet the underlying infection remains. Thus, to enable hour-to-hour sepsis classification, we examined the diagnostic performance of a continuous sepsis score, where each category was scored independently, rather than hierarchically.

High accuracy and high negative prediction



The biomarker correctly identifies 84% of severe sepsis and 85% of non-severe sepsis hours. A 0.91 Area Under the Curve shows high accuracy [7]. The test also provides high Negative Predictive Value to rule-out infection.

This novel biomarker is readily accessible, highly accurate, and provides a real-time diagnostic for severe sepsis

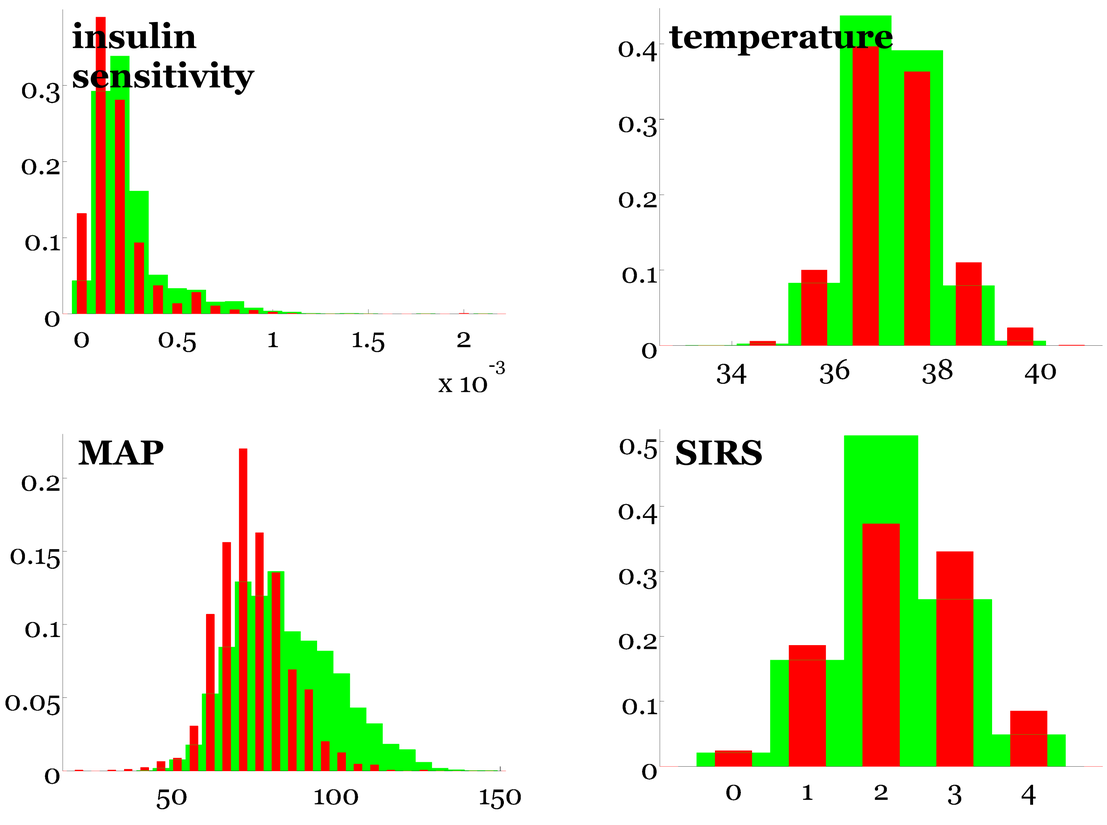


Classification using bedside data

A severe sepsis biomarker was developed from:

- 36 patients at the Christchurch Hospital ICU
- 6550 hours (1690 severe sepsis, 4860 non-severe sepsis)
- insulin sensitivity, temperature, heart & respiratory rate, MAP, SIRS

Kernel density estimates were used for classification [6]. A ROC curve was used to determine diagnostic performance.



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